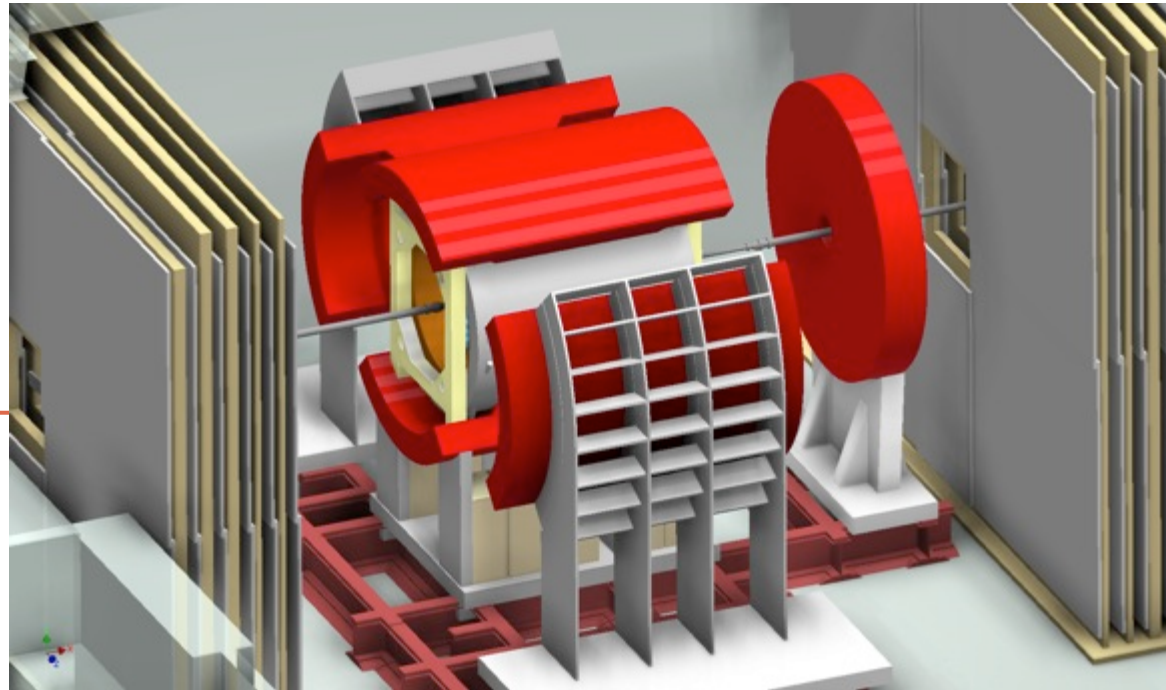


SPHENIX MECHANICAL



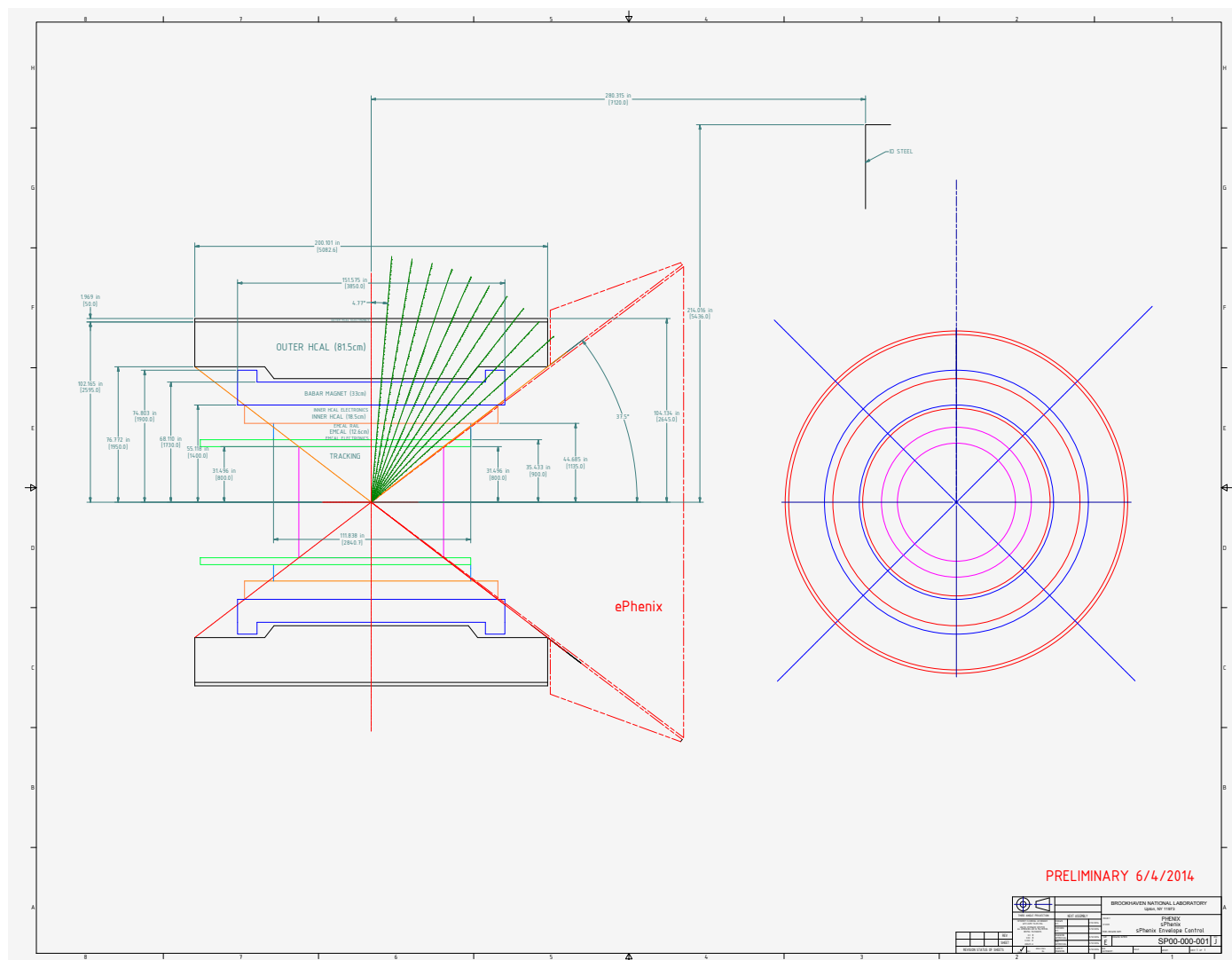
D. Lynch, R. Ruggiero
June 12, 2014

AGENDA:

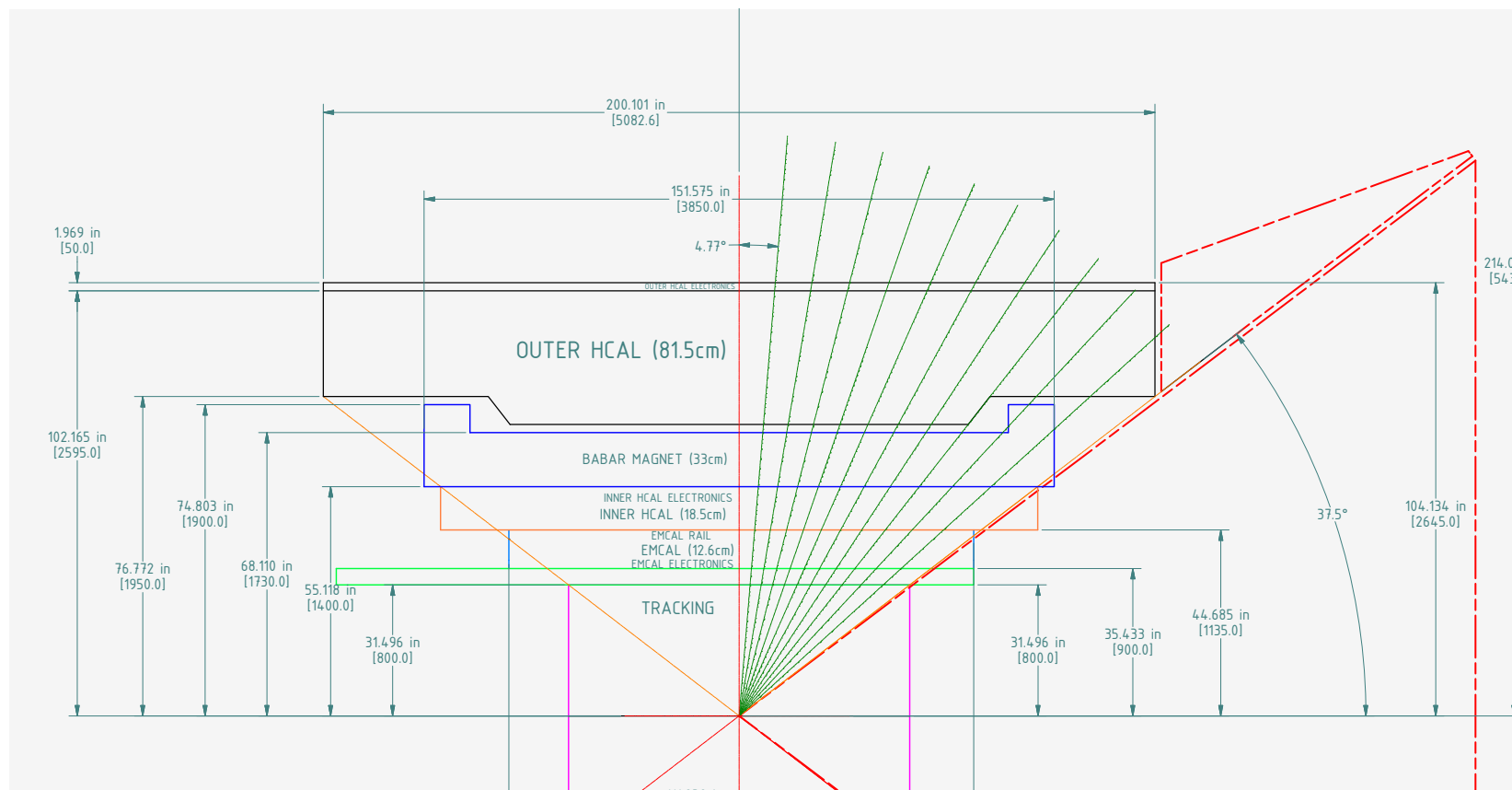
- sPHENIX subsystem envelope (planned updates to rev J)
- Current Mechanical design and new illustrations
- sPHENIX Infrastructure update
- PHENIX Decommissioning Plan update
- sPHENIX Tasks & Schedule
- AOB

6/12/2014

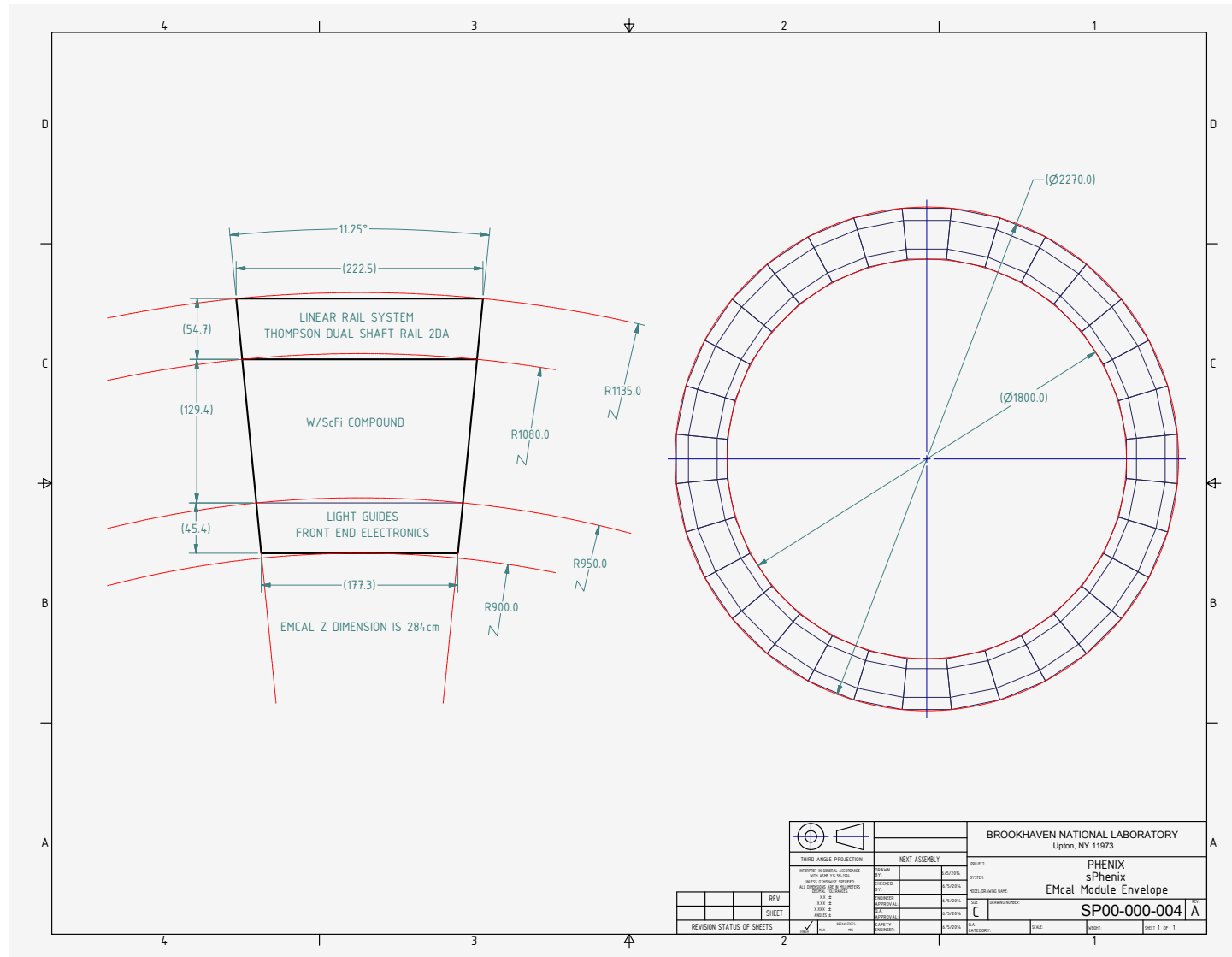
sPHENIX “Innie”/”Bothie” Envelope



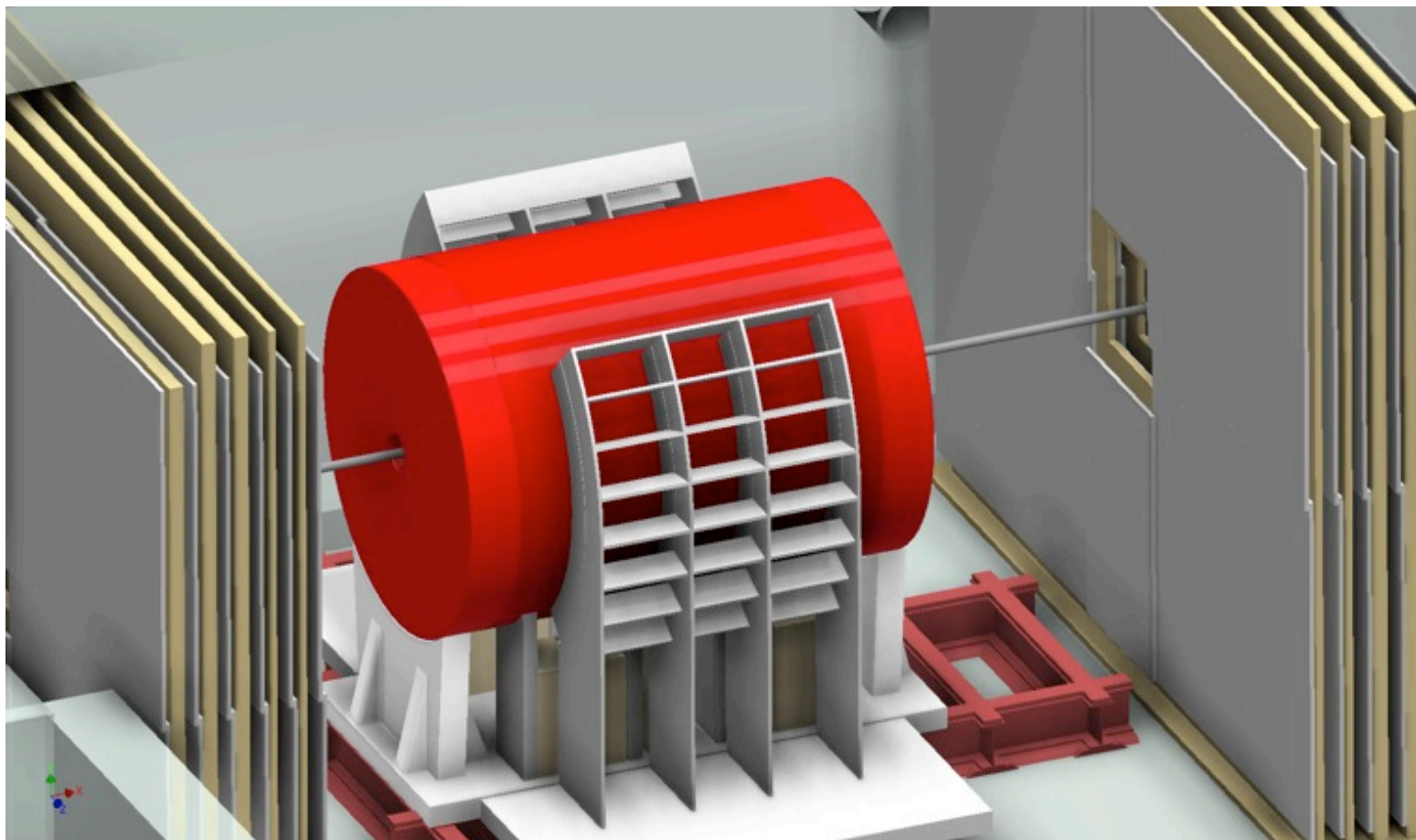
sPHENIX “Innie”/”Bothie” Envelope, closer



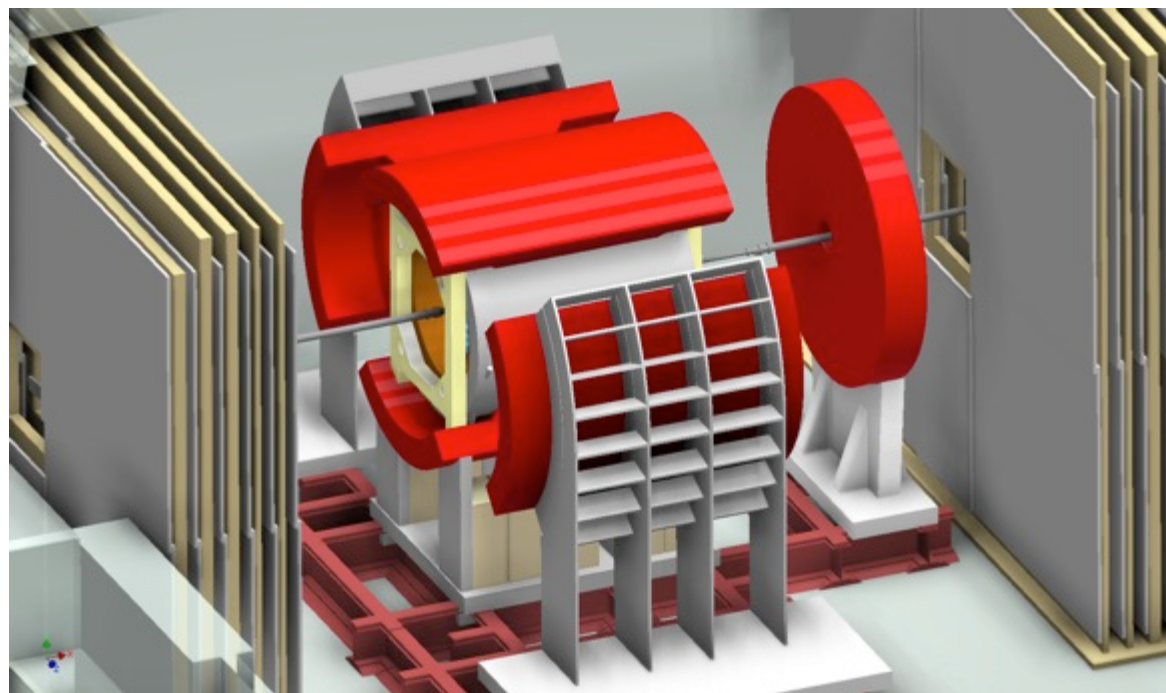
sPHENIX EMCal Envelope



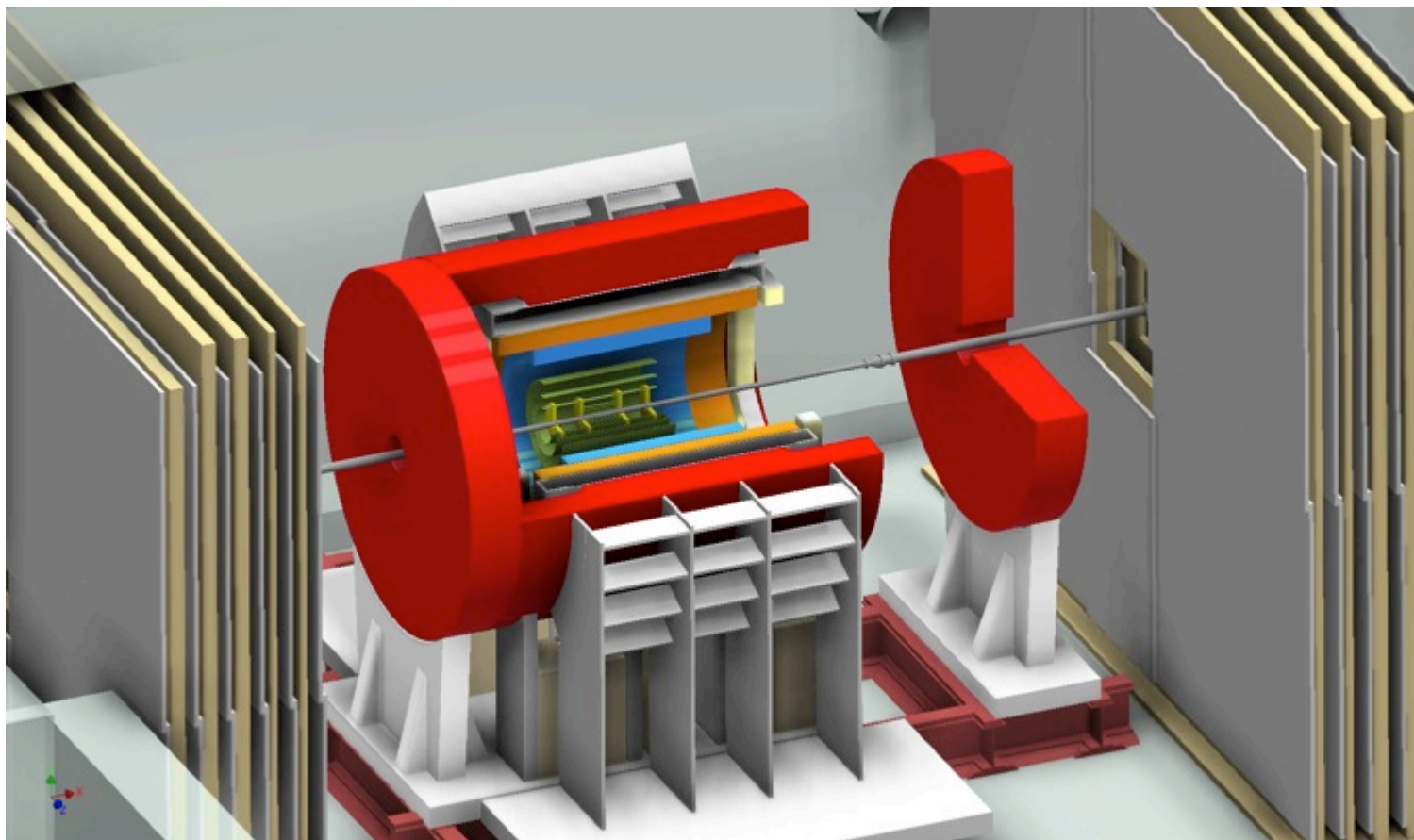
New sPHENIX Illustrations



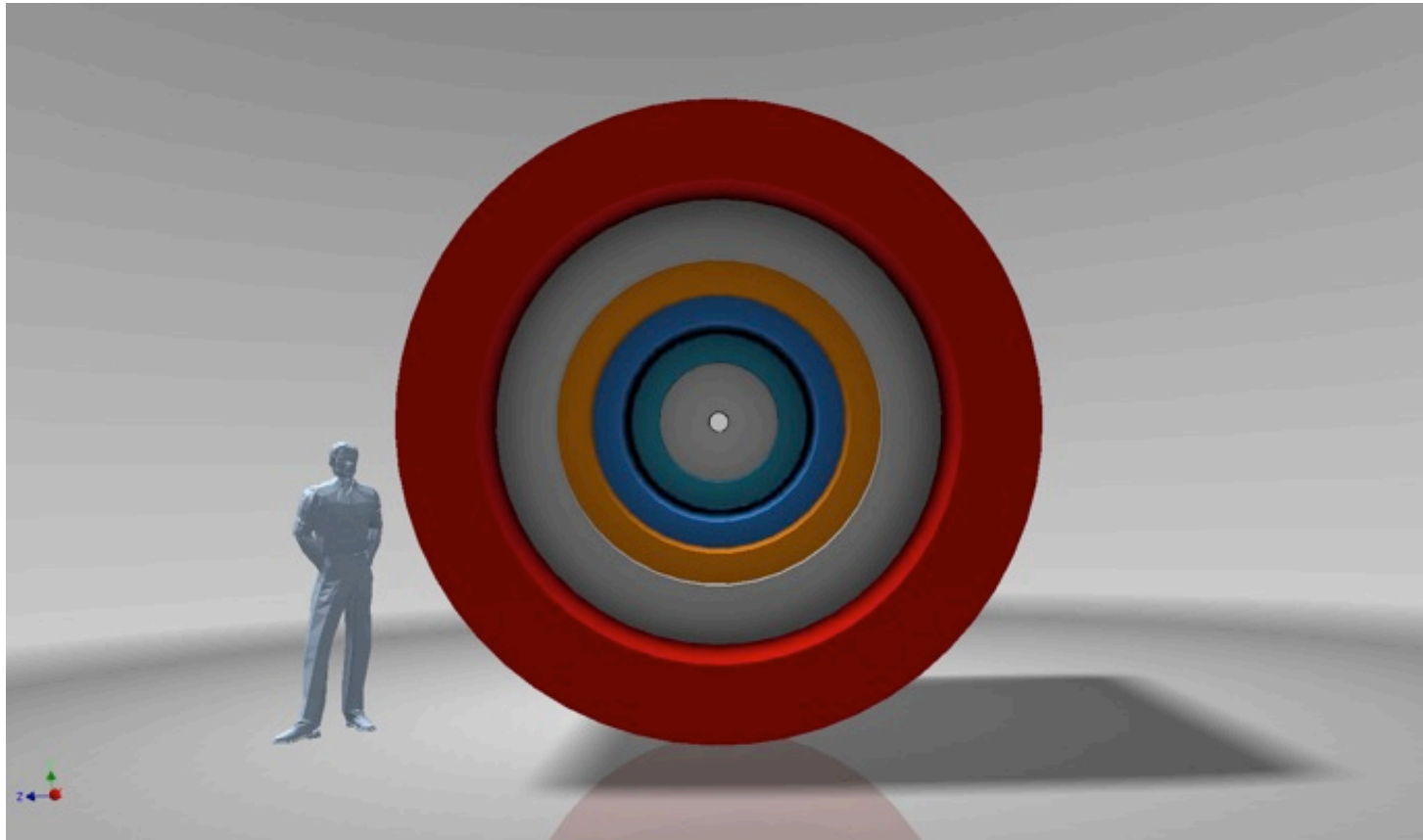
Basic sPHENIX model closed



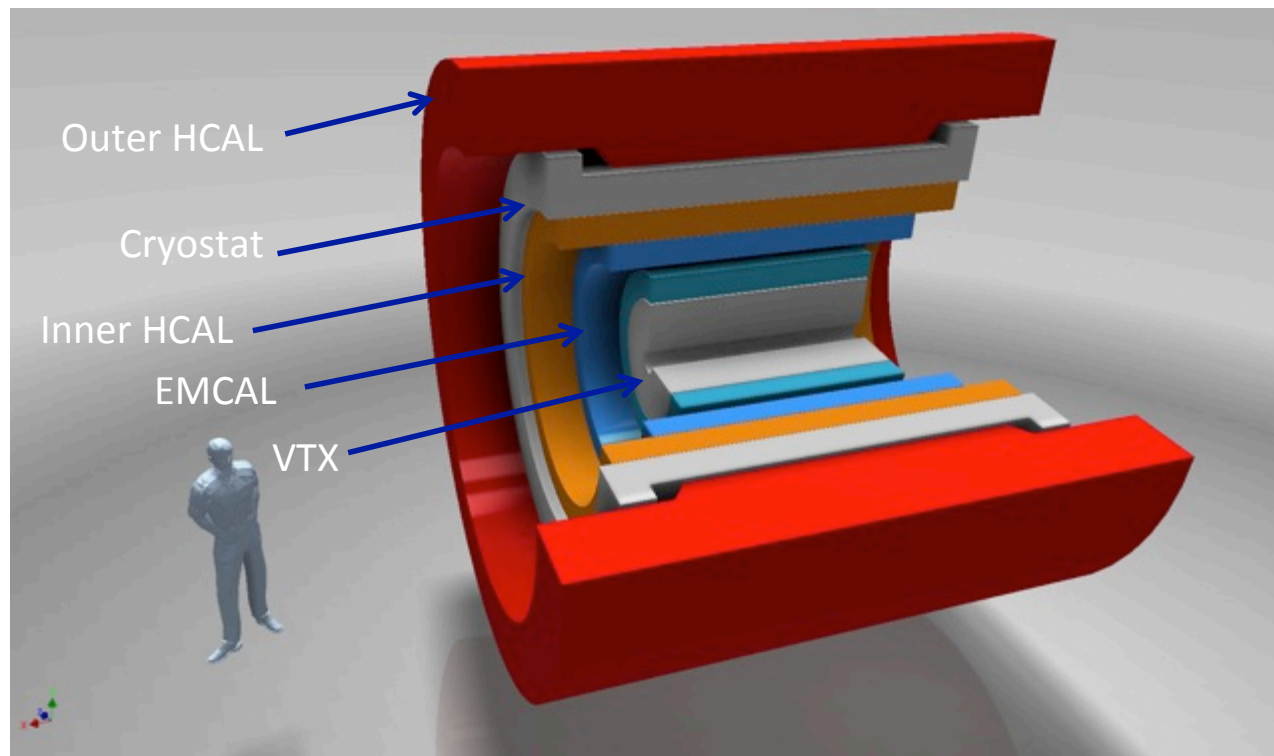
Basic sPHENIX model open



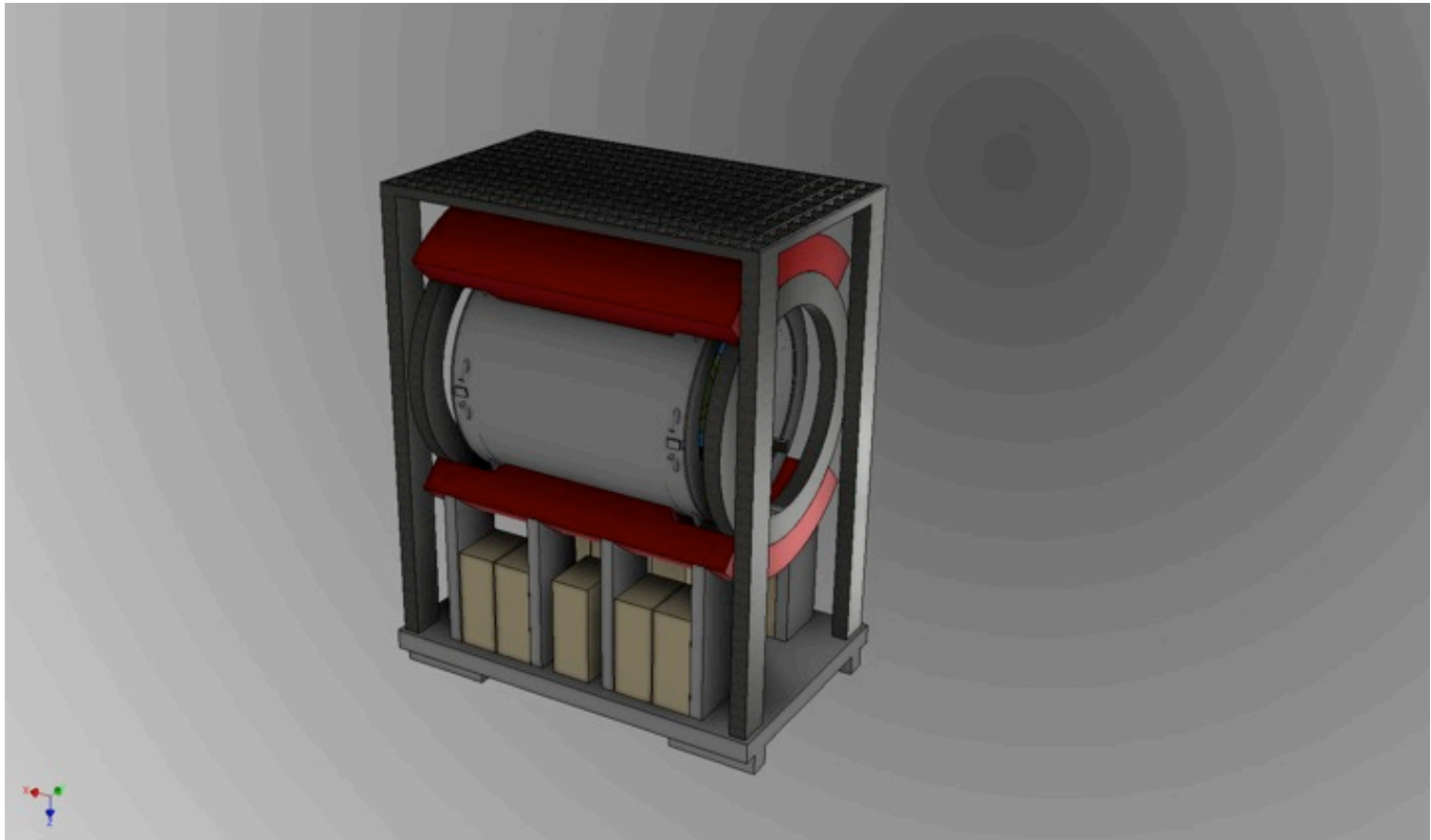
Basic sPHENIX model cutaway



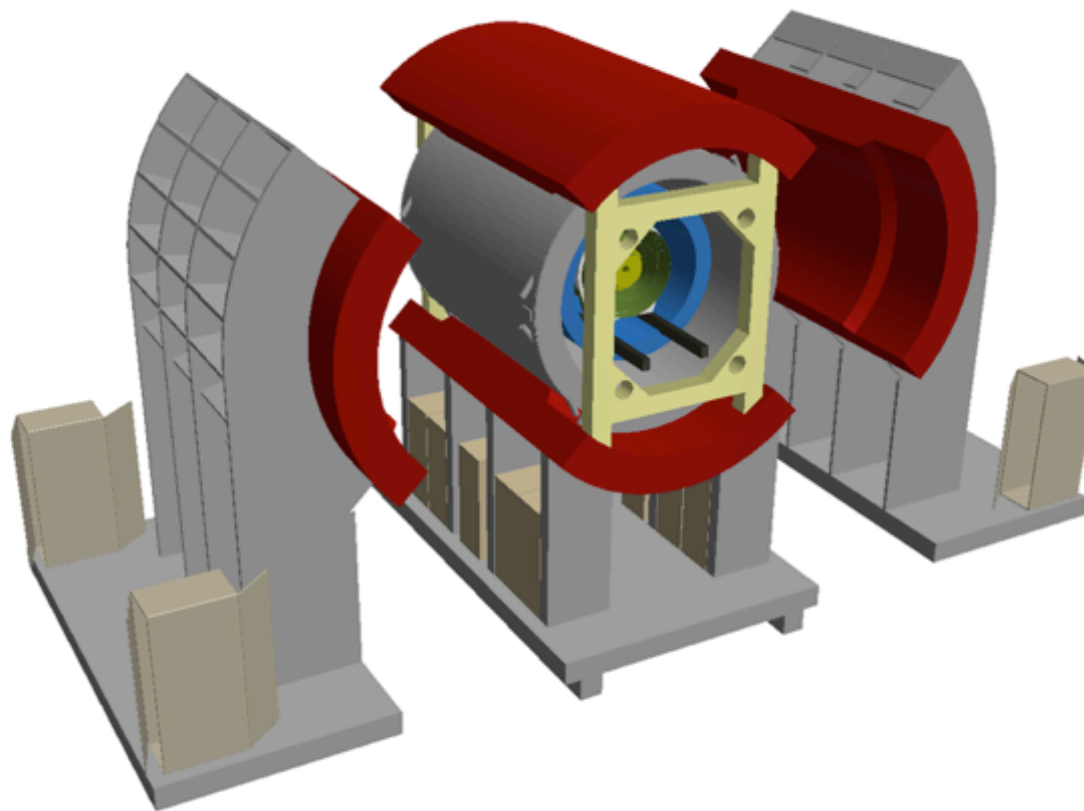
Basic sPHENIX model beams eye view



Major active components with support structure omitted



Initial concept for external support,
racks and upper bridge platform



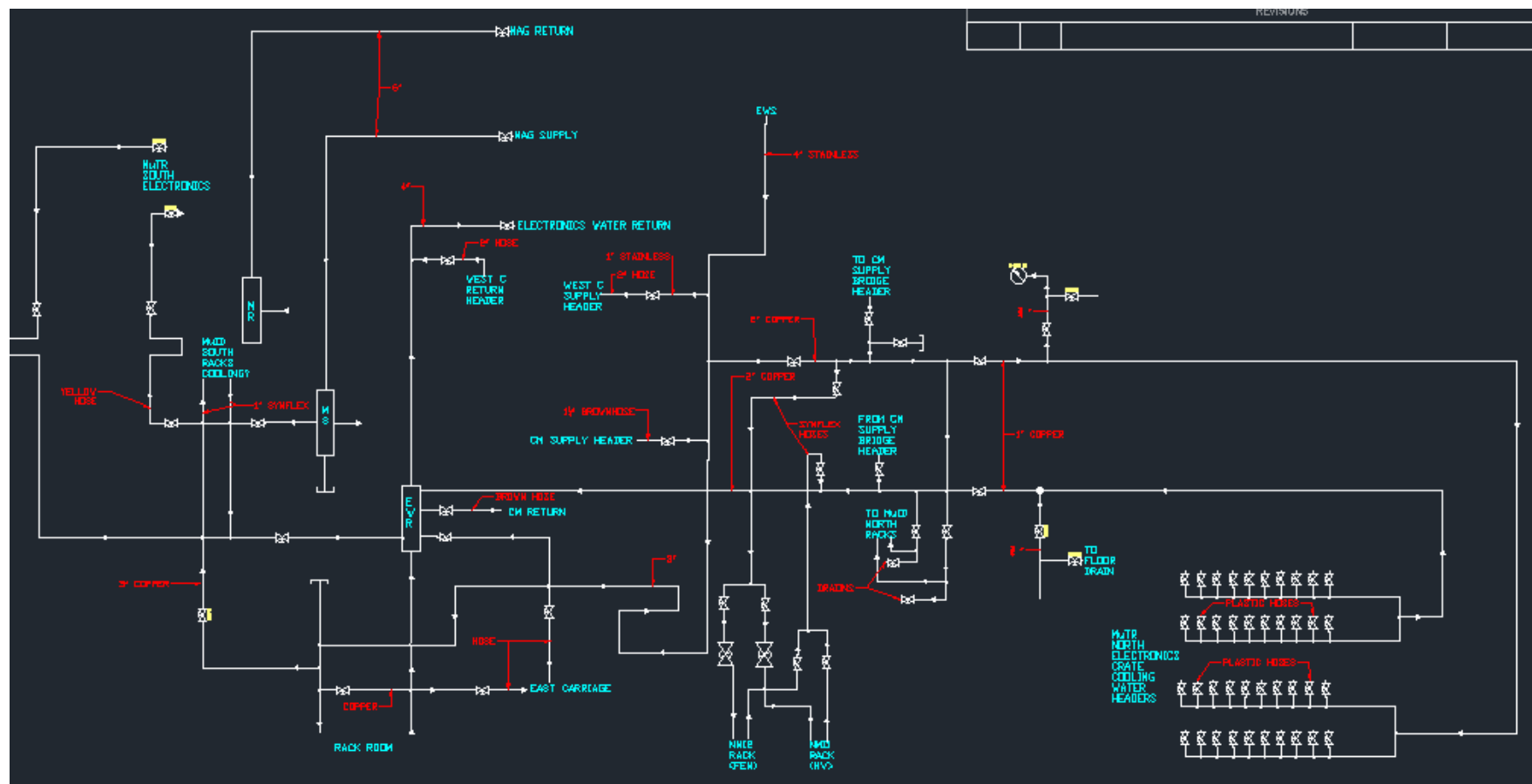
sPHENIX open, with racks

Infrastructure: NICK TULLY, SULI Student:

Working with Paul Giannotti to gather existing PHENIX infrastructure documentation, update and revise as appropriate, modify and augment for sPHENIX

PHENIX Decommissioning: MATT CHIULLI, SULI Student:

Working with Dave Phillips to gather existing PHENIX installation documentation including work permits and Procedures (active and inactive), list and categorize tools and fixtures, begin creating updated documentation to plan PHENIX decommissioning.

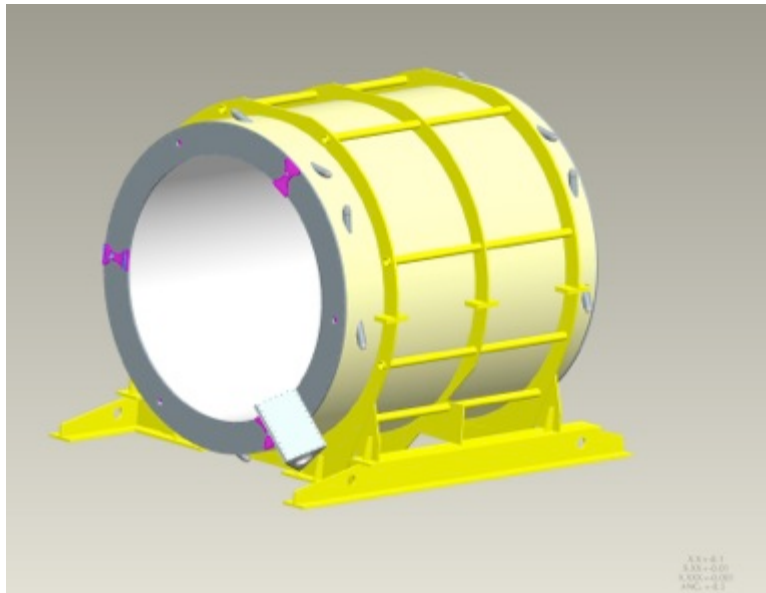


PHENIX COOLING WATER SCHEMATIC

6/12/2014

sPHENIX Mechanical Design

| Detectors | Procedures | Estimated Time of Disassembly | Work Permits | Drawings | Lifting Features & Equipment |
|---|---|--|---|--|---|
| Dish Chamber | Cut all wires and gas lines, move forward on rails, lift off with crane, lay flat on cart, dismantle, outside tent to take structural titanium, rest in dumpster. | 4 Days, 8 CAD Tech Days | na-200002-005 (DC troubleshooting from extension ladder)(12/2/2002-4/12/2003) na-200002-006 (Replace regulator on DCPC gas rack in missing house)(12/18/2002-12/18/2002) 2003-003/55-2003-0026 (Dish Chamber Repair on LH Table)(1/11/2003-12/3/2003) na-2003-007 (Replace Dish Chamber power supplies)(1/19/2003-1/21/2003) 2004-001/1504-1 (Troubleshoot & Repair DC Electronics)(2/11/2004-3/3/2004) 2004-006/55-2004-075 (DC Power supply/Repair)(5/25/2004-8/5/2004) 2004-006/55-2004-107 (Erect DC Repair Tent)(5/23/2004-8/10/2004) 2005-001/55-2005-054 (DC Repair)(2/14/2005-4/9/2005) 2005-003/55-2005-030 (DC Cable Repair)(5/6/2005-6/25/2005) 2005-006/55-2005-038 (DC Repair)(5/24/2005-8/19/2005) 07-006/DRL-2007-006 (DC East & West repairs)(2/9/2007-2/15/2007) 07-024/DRL-2007-023 (DC East & West repairs)(10/5/2007-10/12/2007) 08-001/55-2008-113 (Tap into DC supply in a way to flow either 50/50 Ar/Ethane or 50/50 Ar/Ethane + Fc alcohol)(12/2/2008-12/3/2008) DRL-2009-3 (DC Repair)(1/8/2009-2/4/2009) DRL-2009-15 (DC East Repair)(3/24/2009-10/12/2009) DRL-2009-18 (DC East, West Repairs)(1/16/2009-12/16/2009) DRL-2010-13 (DC East & West Troubleshooting & Repair)(12/10/2010-1/11/2011) DRL-2011-003 (DC East & West Troubleshooting & Repair)(12/5/2010-3/1/2011) DRL-2011-028 (DC East & West Troubleshooting & Repair at the start of run 12)(1/14/2011-12/12/2011) DRL-2012-001 (DC East & West Troubleshooting & Repair prior to run 13)(1/17/2012-12/5/2012) DRL-2012-002/255-2012-126 (DC East & West Troubleshooting & Repair during run 13)(2/8/2012-2/19/2012) DRL-2012-007 (DC Troubleshooting & Repair during run 12)(2/3/2012-3/19/2012) DRL-2012-011 (DC Troubleshooting & Repair during run 12)(3/14/2012-5/16/2012) DRL-2013-003 (DC troubleshooting & repairs prior to run 13)(2/14/2013-3/28/2013) DRL-2013-004 (DC troubleshooting & repairs during run 13)(3/19/2013-3/29/2013) DRL-2013-012/55-2013-238 (DC East Window replacement)(12/10/2013-10/11/2013) DRL-2014-002 (DC East FEM Repair during run 14)(3/11/2014-na) | ✓ (Cartage Fall Folder) (DC Cable Routing) (DCPC Installation Procedure) | Slings (2) 20-ft, 6200-lb capacity in vertical configuration 40-Ton Assembly Hall Crane 12-Ton Collision Hall Crane 2 Chain Falls rated at or above 3000-Lb each |
| Pad Chamber & Pad Chamber 3 | Remove PC-1 from the back of DC, throw in dumpster. Disconnect PC-3 by cutting all services, unbolt and slide out the bottom, toss in dumpster. | 4 Days, 8 CAD Tech Days | na-200002-006 (Replace regulator on DCPC gas rack in missing house)(12/18/2002-12/18/2002) 07-011/DRL-2007-011 (PC Electronics Repair work permit)(5/23/2007-6/30/2007) DRL-2009-10 (PC1 Repair)(5/23/2009-9/24/2009) DRL-2010-1 (PC1/2 Troubleshooting)(12/20/2010-12/29/2010) DRL-2010-22 (PC1 East and West Troubleshooting & Repair)(12/20/2010-1/24/2011) DRL-2011-014 (PC1 Repair)(5/23/2011-12/15/2011) | ✓ (PC-1 Cable Routing) (PC-3 Cable Routing) (PP-2 S.S. 4-06, TECPC3 Installation Procedure) | |
| Ring Imaging Cherenkov Detector | Cut service lines, unbolt RICH north and south, attach to crane at vessel's center of gravity, move to truck, move to staging area, salvage all PMT modules, dispose of all remaining parts. | 14 Days, 8 CAD Tech Days Total = 8 days, 8 PHENIX Tech Days, 8 CAD Tech Days | 9B-000 (Remove RICH Detector) 9B-003 (Remove Top of Tent) 9B-011 (Remove Gas Vessel and Transport) 9B-012 (Replace transition plates & pivots on RICH Vessel) na-1333-005 (welding repair leaks in RICH vessel)(5/13/2013-8/3/2013) | ✓ (RICH Cable Routing) (RIL Website) (RICH Installation Procedure, PP-2 S.S. 4-01) | (2) Pivot Pins, PIN 002-0501-303 Spreader Bar Chain Falls Doubled Slings Lifting Frame Swivel Shackles Load Cell Crane |
| Time Expansion Chamber | Unbolt, remove 1 sector at a time using crane, disassemble/cut up into disposable chunks and discard in dumpster. | 4 Days, 8 CAD Tech Days | 06_011/DRL-2006-005 (TEC Repair)(6/30/2006-10/15/2006) | ✓ (TEC Cable Routing) (PP-2 S.S. 4-06, TECPC3 Installation Procedure) | 30-Ton Lift Beam (1) SN 32724, Model # 205-80-14 Swivel Eyes: 38-16 Swivel Eyes (4), 1000 lb capacity 3/4-10 Swivel Eyes (2), 5000 lb capacity Slings: 3-Ton Capacity (2) TEC 2-Ton Lifting fixture (1) SN 02208, Model # 259-2-80, Item SE302093 Win Rope Tumbuckle Assembly Drawing 002-0206-1018 (2) Chain Fall 3-Ton Capacity (2) 4"x4"x7" wood blocks (2) |
| Electromagnetic Calorimeter | Cut all service lines, Remove EM Cal Racks and toss in dumpster, Disconnect and remove all EM Cal modules and move to safe storage area. | | na-1398-004 (Pu EM Cal detector on truck)(8/3/1998-8/4/1998) 06_012/DRL-2006-006 (EM Cal Repairs)(8/30/2006-10/15/2006) | | 30-Ton EM Cal Lift Beam 2'6" long, 15-Ton Slings (2) M-24 Shoulder Eyes, 3-Ton Capacity (4) Swivel Eyes: 3-Ton Capacity (4) 2-Ton Capacity (4) Chainhoists: 5-Ton Capacity (2) 2-Ton Capacity (2) Slings: 5-Ton Capacity (2) 3-Ton Capacity (2) 2-Ton Capacity (3) Triangular attachment plates (2) |
| PbSC East PbGI | Disconnect from EM Cal and move to safe storage area. Disconnect from EM Cal and move to safe storage area. | 10 Days, 10 PHENIX Tech Days, 10 CAD Tech Days | n/a n/a | ✓ (PbSC East Cable Routing) | |
| Electronics Racks | Strip all unwanted electronics from racks, cut all wires, remove all inner components and dispose except for rack components and main power supplies. Keep racks. | 1 Day 1 PHENIX Tech Day to strip all racks, 1/4 Day 1/2 PHENIX Tech Day to remove from EC to AH floor, 1 Day 4 Rigger Days to move all EC racks to safe storage, 24 racks to be salvaged. Total = 30 Days, 36 PHENIX Tech Days, 4 Rigger Days. | PAG-2012-001 (Install Power Meter modules on the Rack Room East & West HVAC condensers)(8/22/2012-na) DRL-2011-002 (FEM Troubleshooting)(1/18/2011-2/1/2011) DRL-2014-002 (DC East FEM Repairs during run 14)(3/11/2014-na) | ✓ (East Cartage North Side, East Cartage South Side Cable Routing) | Railing to ensure the safety of the on-cartage work away from the building wall Man-Lift to hook up electronic racks to crane Crane Equipment necessary to strip electronics |
| Deconstruct Cartage and dispose/recycle | Unbolt and remove rack platforms to floor level for cut up. Cut up rack platforms into disposable segments and stack outside AH for vendor removal. Rotate cartage frame 90 degree to disassemble. Disassemble services and discard in dumpster, Disassemble/cut cartage frame into disposable segments and stack outside of AH for vendor removal. | 20 days 40 CAD tech days 85 Days, 54 PHENIX Tech Days, 4 Rigger Days, 32 CAD Tech Days | | | |
| Total EC | | | | | |



Magnet (BABAR) (Magnet Div)

- | | |
|---|------------|
| • Acquire rights | Done |
| • Evaluate Transport | Done |
| • Design Transport fixtures | Done |
| • Fabricate Transport Fixtures | 6/15/14 |
| • Evaluate BNL test facility requirements | 8/1/14 |
| • Prepare test facility | 9/1/14 |
| • Install Transport fixtures | 9/1/14 |
| • Transport to BNL | 9/15/14 |
| • Install in test facility | 10/1/14 |
| • Design tests/test equipment | 10/1/14 |
| • Fabricate/procure test equipment | 1/1/15 |
| • Run tests | 6/1/15 |
| • Design Magnet modifications | 12/1/14 |
| • Fabricate magnet modifications | 6/1/15 |
| • Install magnet modifications | 8/1/15 |
| • Evaluate final installation | 9/1/15 |
| • Design installation support equipment | 12/31/2015 |
| • Fabricate/procure support equipment | 7/1/2018 |
| • Transport to IR | 6/10/2019 |
| • Install | 8/30/2019 |
| • Test | 10/25/2019 |
| • Commission | 11/22/2019 |

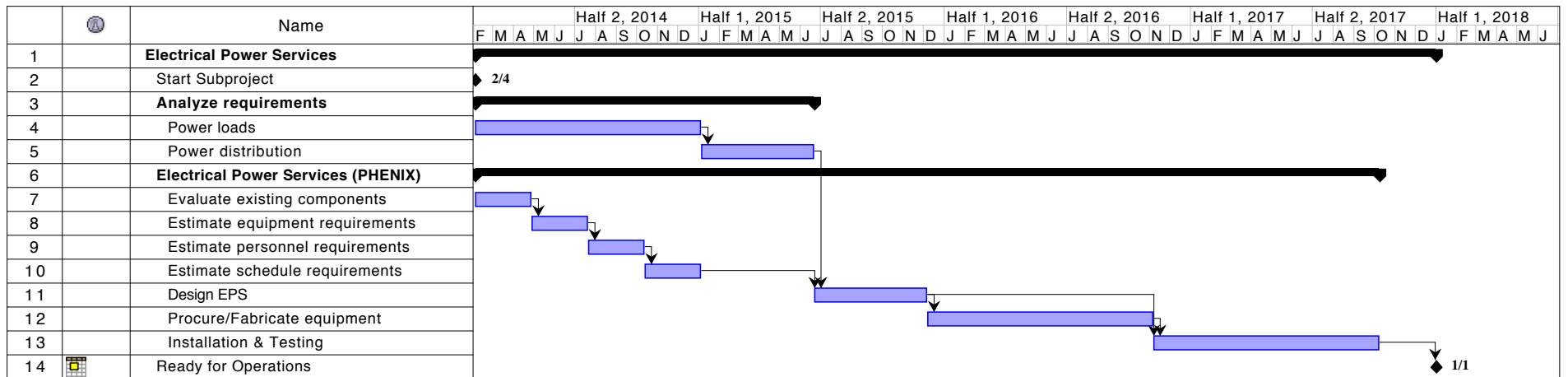
Mag Div. plans to finalize magnet transportation:

- Magnet move
 - Thermal shield stabilizers are in the shops,
 - Completion expected by July 1.
 - 2 quotes for shipping by truck of the solenoid and the valve box ~ \$40k.
 - Other equipment to ship , conventional widths, air-ride is desirable
 - Send someone from Mag div to oversee/help with stabilizer install
 - Transport should take ~ 2 weeks, want it completed this fiscal year
 - 1008B suggested for storage of power supply & dump resistor; floor plans to be consulted
- Magnet testing
 - Reasonable location in 912 suggested, but CAD (Dave Phillips) to model magnet with floor plan and propose appropriately;
 - Probably need to be there for testing for at least one year.
 - Could be tested with the existing stack.
Only very low power testing of the magnet in 912 is being considered. a spare RHIC quadrupole supply would be adequate for testing.
 - Roberto and Jerry will determine whether the proposed landing spot will be amenable to cryo.
- Stack Modification
 - Envelope drawing (rev J, "Innie") showed which shows the detector envelope.
 - Want to know the relative cost (money, difficulty, risk) of using the chimney as-is vs. modifying it to stay out of the acceptance.
 - Paul will begin looking into what would be needed;
 - Roberto and Jerry have thought about it and will work with Paul.
- Next Biweekly Magnet planning meeting next Wednesday, 6/18

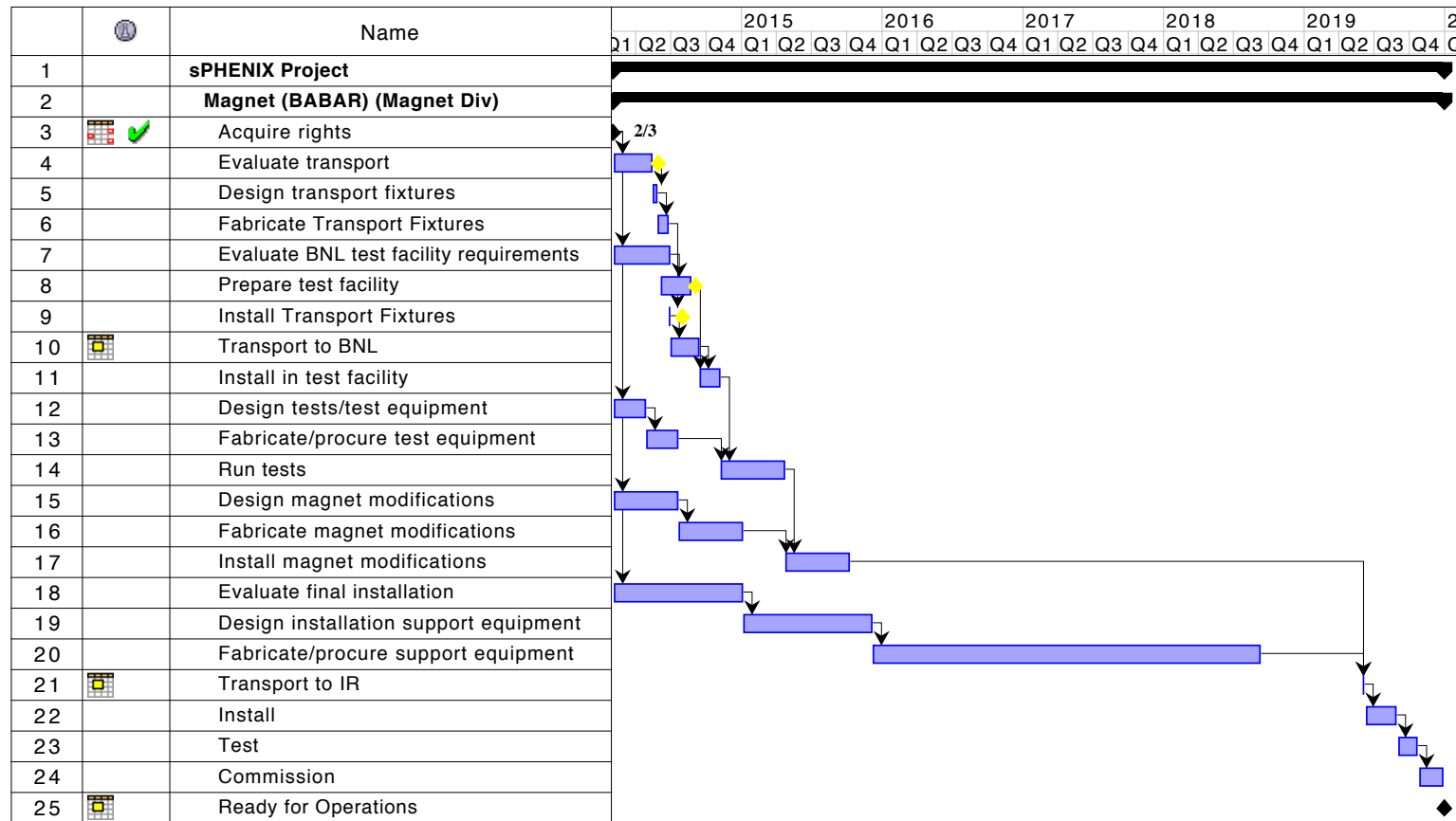
sPHENIX Engineering:

Major Subsystems/Subtopics:

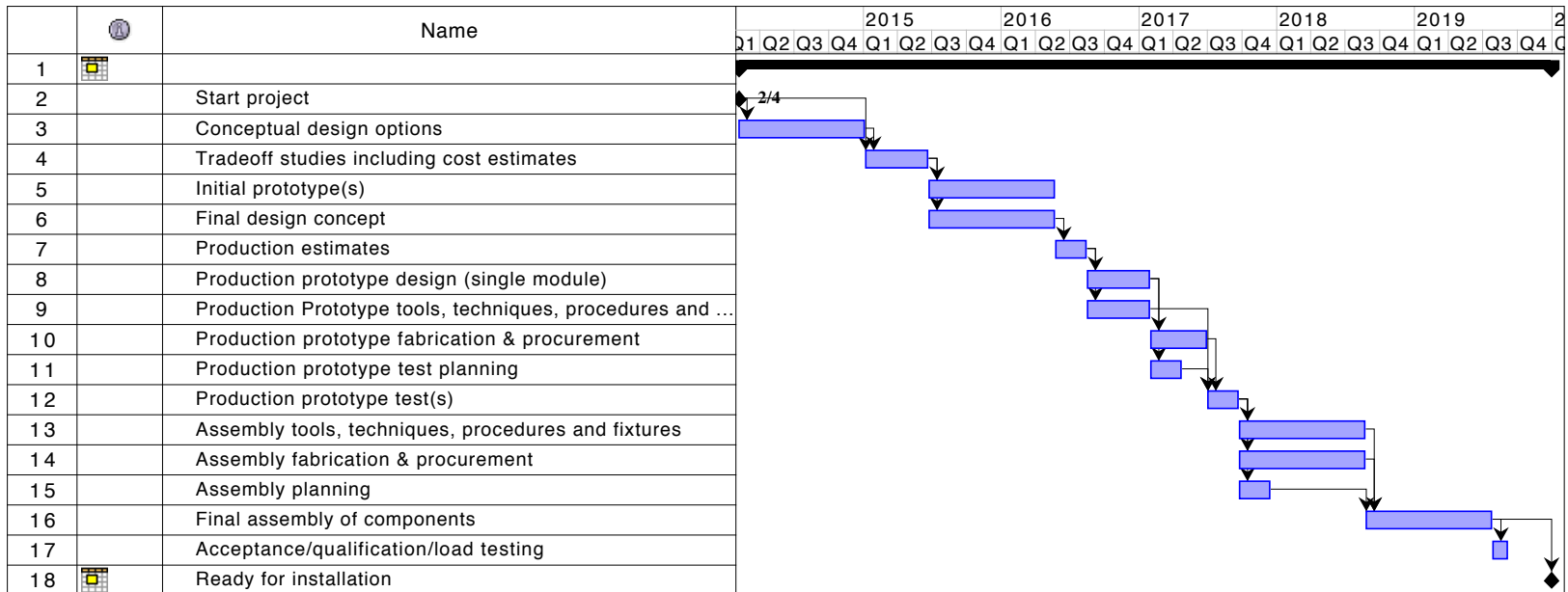
| | |
|--|---------------------|
| • Magnet (BABAR) (Magnet Div) | 2/1/14 - 12/31/2018 |
| • Hadronic Calorimeter (HCAL) (PHENIX) | 2/1/14 - 12/31/2020 |
| • EM Calorimeter EMCal (PHENIX) | 2/1/14 - 12/31/2020 |
| • VTX (RIKEN) | 2/1/14 - 12/31/202 |
| • DIRC (?) | ? - 12/31/2020 |
| • VTX additional layers (RIKEN) | ? - 12/31/2020 |
| • Carriage Support structure (PHENIX) | 2/1/14 - 12/31/2020 |
| • Readout Electronics (PHENIX) | 2/1/14 - 12/31/2020 |
| • Infrastructure (PHENIX ++) | |
| • Electrical Power Services (PHENIX) | ? - 12/31/2017 |
| • Instrumentation Support (Signal trays & Racks) (PHENIX) | ? - 12/31/2020 |
| • Cryo Services (CAD) | 2/1/14 – 8/1/2018 |
| • Cooling water (CAD) | ? - 12/31/2017 |
| • Safety Systems (PHENIX) | ? - 12/31/2020 |
| • Work Platforms and Access/Egress Structures (CAD) | ? - 12/31/2017 |
| • HVAC (CAD) | ? - 12/31/2017 |
| • PHENIX Decommissioning (CAD, PHENIX) | ? - 6/30/2017 |
| • System Integration (PHENIX) | 2/1/14 - 12/31/2020 |
| • Testing (PHENIX) | 2/1/14 - 12/31/2020 |
| • Installation (PHENIX, CAD) | 2/1/14 - 12/31/2020 |
| • Commissioning (PHENIX) | 2/1/14 - 12/31/202 |



Electrical Power Services Schedule: Paul Giannotti



Babar Magnet Schedule: Mike Anarella



VTX Additional Layers Schedule: Ed O'Brien

Major SubProjects and Managers

Hadronic Calorimeter - Don Lynch

EM Calorimeter - TBD (CAD?)

VTX - Ed O'Brien

DIRC - TBD

VTX additional layers

Carriage Support structure – Don Lynch

Readout Electronics - Eric Mannel

Infrastructure - Paul Giannotti

Electrical Power Services - Paul Giannotti

Instrumentation Support (Signal trays & Racks) Paul Giannotti

Cryo Services - Roberto Than (CAD)

Cooling water - Joe Scadudo (CAD)

Safety Systems - Paul Giannotti

Work Platforms and Access/Egress Structures - Dave Phillips (CAD)

HVAC - TBD (Plant Engineering)

PHENIX Decommissioning - Dave Phillips (CAD)

System Integration - Don Lynch

Testing - TBD

Installation - Don Lynch

Commissioning - TBD